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ON

25 JUN 2002

L1 58226 SEA (PLASMA) (5A) (LIKE OR SUBSTITUTE OR SUBSTITUTES OR
ARTIFICIAL OR SYNTHETIC)
L2 1928 SEA L1 AND (CARBON DIOXIDE OR CO2 OR CO".SUB."2)
L3 1294 SEA L2 AND (KIT OR KITS OR SYSTEM OR SYSTEMS)
L4 165 SEA L3 AND (CARBON DIOXIDE OR CO2 OR CO".SUB."2) (5A) (REDUC?
OR LOWER? OR REMOV? OR DECREAS?)
L5 161 DUP REM L4 (4 DUPLICATES REMOVED)
D 1-161
L6 51 SEA L2 AND (CARBON DIOXIDE OR CO2 OR CO".SUB."2) (5A) (REDUC?
OR LOWER? OR REMOV? OR DECREAS?) NOT L4
L7 45 DUP REM L6 (6 DUPLICATES REMOVED)
D 1-45

L11 ANSWER 18 OF 43 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1996:423142 CAPLUS

DOCUMENT NUMBER: 125:104684

TITLE: **Carbon dioxide** transport by hemoglobin-based blood substitutes

AUTHOR(S): Winslow, Robert M.

CORPORATE SOURCE: Sch. Med., Univ. California, San Diego, San Diego, CA, 92161, USA

SOURCE: Blood Substitutes: New Challenges (1996), 146-162.

Editor(s): Winslow, Robert M.; Vandegriff, Kim D.;

Intaglietta, Marcos. Birkhaeuser: Boston, Mass.

CODEN: 62ZGAT

DOCUMENT TYPE: Conference

LANGUAGE: English

CLASSIFICATION: 1-8 (Pharmacology)

ABSTRACT:

Carbon dioxide transport by blood is often overlooked when considering the design and clin. potential of cell-free O₂ carriers. However, approx. the same amt. of CO₂ is **removed** from respiring tissue as O₂ delivered to, and the implications for blood substitutes must be considered, esp. in critically ill patients where tissue CO₂ build-up could be very high. Approx. 23% of total CO₂ is transported as carbamate (i.e., bound to Hb) and is "oxy-labile" (the affinity of deoxy Hb for ***CO₂*** is higher than that of oxyHb). In addn. to this important role of Hb, red cells are also crit. to overall CO₂ transport because they contain carbonic anhydrase which permits the rapid hydration of CO₂ to bicarbonate and hydrogen ion. Without this enzyme, the hydration reaction would be much slower than the circulation time. Except for .alpha..alpha.-Hb, which has **reduced** CO₂ binding, little is known about the effects of crosslinking on CO₂ binding. It is of interest to consider how CO₂ transport is handled naturally by underwater (crocodiles) and high altitude animals (sheep and goats) who are faced with O₂ shortages in nature.

SUPPL. TERM: **carbon dioxide** transport Hb blood substitute

INDEX TERM: Biological transport
Blood **substitutes** and Plasma expanders
Erythrocyte

(**carbon dioxide** transport by Hb-based blood substitutes)

INDEX TERM: Hemoglobins

ROLE: BAC (Biological activity or effector, except adverse);

BSU (Biological study, unclassified); THU (Therapeutic use);

BIOL (Biological study); USES (Uses)

(**carbon dioxide** transport by Hb-based blood substitutes)

INDEX TERM: 9001-03-0, Carbonic anhydrase

ROLE: BAC (Biological activity or effector, except adverse);

BSU (Biological study, unclassified); BIOL (Biological study)

(**carbon dioxide** transport by Hb-based blood substitutes)

INDEX TERM: 124-38-9, **Carbon dioxide**, biological studies 7782-44-7, Oxygen, biological studies

ROLE: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)

(**carbon dioxide** transport by Hb-based blood substitutes)

INDEX TERM: 71-52-3, Bicarbonate 12408-02-5, Hydrogen ion, biological studies

ROLE: BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation,

nonpreparative)
(**carbon dioxide** transport by Hb-based
blood substitutes)

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